Atty. Dkt. No. 200310932-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: McGarry et al.

Title: PRINTING SYSTEM

Appl. No.: 10/699,893

Filing Date: 11/3/2003

Examiner: Nguyen, Thinh H.

Art Unit: 2861

DECLARATION UNDER 37 C.F.R. 1.131

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

We, Mark McGarry, Robert Fogarty, Josep-Maria Serra, Ronald D. Stephens, and Kurt Thiessen, state and declare that:

1. Each of us is an inventor of at least one of originally filed Claims 1 through 65 of U.S. Patent Application Serial No. 10/699,893, filed on 11/3/2003, and entitled "Printing System."

2. We understand that in an Office Action dated February 22, 2006, claims 1-5, 17-18, 40-44, 50, and 59 of the 10/699,893 patent application were rejected as being anticipated based on European Patent Application EP1329322.

3. We understand, based on the information provided on the front page of European Patent Application EP1329322, that European Patent Application EP1329322 was published on July 23, 2003.

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4. Prior to July 23, 2003, we conceived in the United States the invention described in claims 1-5, 17-18, 40-44, 50, and 59 of the above-referenced Application as evidenced by the attached Exhibit A.

5. Exhibit A is a redacted copy of an invention disclosure which was written and dated prior to July 23, 2003. Exhibit A generally describes a printhead brick assembly.

6. Exhibit B is a redacted copy of an invention disclosure which was written and dated prior to July 23, 2003. Exhibit B generally describes an ink delivery system.

7. Exhibit C is a redacted copy of an invention disclosure which was written and dated prior to July 23, 2003. Exhibit C generally describes an umbilical.

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8. We hereby declare that all statements made herein of our own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 04/13/06 By: _____
Mark McGarry

Date: 4/13/06 By: _____
Robert Fogarty

Date: 04/23/06 By: _____
Josep-Maria Serra

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Ronald D. Stephens

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Kurt Thiessen

Atty. Dkt. No. 200310932-1

EXHIBIT A

Invent

Disclosure No. 200310932

Invention Disclosure - DBi Document No. 6KSW

PD No.	Date Received	Collection
[redacted]	[redacted]	IPG

General Information

Title printhead brick assembly

Abstract The present invention includes a housing, a plurality of printheads and stalls, and a tubing assembly, printhead cable assembly, pen driver pca, electrical connector, and manifold assembly. An operator inserts a printhead into each stall, mates the printhead brick assembly to an umbilical, and initiates printing.

Projects TIJ 3.X imager

Attachments

Attachments 6KSW_fig1.ppt - [redacted] - FIG describing invention (Uploaded by Mark McGarry)

Description of Invention

Problems Solved Problem: SPS OEM partners find it exceedingly difficult to integrate HP TIJ technology into their printing systems.

Problem: apparatus for quickly and easily switching inks on a printer does not exist. The present invention provides apparatus which allows end users to avoid costly downtime associated with flushing/purging old ink and replacing it with a new type of ink (prior method).

Problem: HP must disclose an unacceptable amount of intellectual property to OEM pamters when integrating TIJ into their printers.

Problem: HP technical support of piece/part product offerings and reference designs is exceedingly difficult (during both product development AND mature support of HP products in OEM printing systems)

Problem: SPS cannot scale their business quickly enough using the current product offering.

Prior Solutions SPS has previously offered component-level piece parts and reference designs to OEM partners for integration of TIJ into their printers. Unfortunately, SPS and OEM partners have found this approach requires an unacceptable amount of resources to implement successfully. Furthermore, HP had to disclose an unacceptable amount of HP intellectual property for a successful implementation. This has prevented SPS from scaling their business since a finite number of implementations can be done using finite SPS resources. This approach does not allow for quick and easy changeover of ink type, i.e., OEM printers have ink tubing dedicated to one particular ink type.

Description Please refer to the attached figure. The present invention includes a housing, a plurality of printheads and stalls, and a tubing assembly, printhead cable assembly, pen driver pca, electrical connector, and manifold assembly.

The tubing assembly includes ink tubing, a plurality of septum housings, and a needle. The septum housings are mechanically keyed such that they receive only a particular printhead having a particular ink type. The needle is mechanically keyed such that it fits into only one of the plurality of septum housings on the manifold assembly. This prevents unintentional mixing of different ink types.

The printhead cable assembly provides electrical communication between each printhead and the pen driver pca.

The manifold assembly includes a plurality of septum housings attached to a manifold block. Each septum housing is mechanically keyed such that they each receive a particular needle. This prevents unintentional mixing of different ink types.

Each printhead is replaceably positioned in a printhead stall. Each septum housing is replaceably attached to a printhead stall, and the needle is replaceably attached to a predetermined manifold septum housing to allow fluidic communication between each printhead and the manifold assembly.

The electrical connector is electronically coupled to the pen driver pca and mounts to the housing. Each stall mechanically attaches to the housing. The manifold block attaches to the housing.

The electrical connector and manifold assembly interface directly with mating components on an umbilical (refer to invention disclosure 6KSZ).

The plurality of printheads are arranged in a particular staggered configuration to achieve a particular print swath and printing speed (throughput). Many other staggered configurations would be obvious to one of skill in the art.

An operator inserts a printhead into each stall, mates the printhead brick assembly to an umbilical, and initiates printing.

Advantages The present invention allows OEM partners to more quickly and easily integrate HP TIJ technology into their printing systems. The present invention reduces time to market by reducing product development efforts of OEM partner and SPS.

The present invention reduces exposure of HP intellectual property to OEM partners when integrating TIJ into their printers.

The present invention allows more efficient HP technical support during both product development AND mature support of HP products in OEM printing systems.

The present invention provides apparatus which allows end users to avoid costly downtime associated with flushing/purging old ink and replacing it with a new type of ink.

Consequently, the present invention will allow SPS to more quickly scale their business.

Invention History

Published [redacted]

Announced

Disclosed

Next Three Months
Described
Built
Government Contract
Related Disclosure
Innovation Workshop

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Company

Classification

Recommended Classification	IPG: Imaging Hardware: Mechanical - Marking Engine Handling and Other
Legal Techword	carriages - cartridge arrangements, printhead alignment, interconnect, latching mechanisms, bearings, pen-to-paper spacing, drive system, and communication with stationary electronics
Keywords	TIJ 3.X printhead brick
Recommended Merlin Entity	IHWMK
Recommended Merlin Loc	.

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Administrative Record

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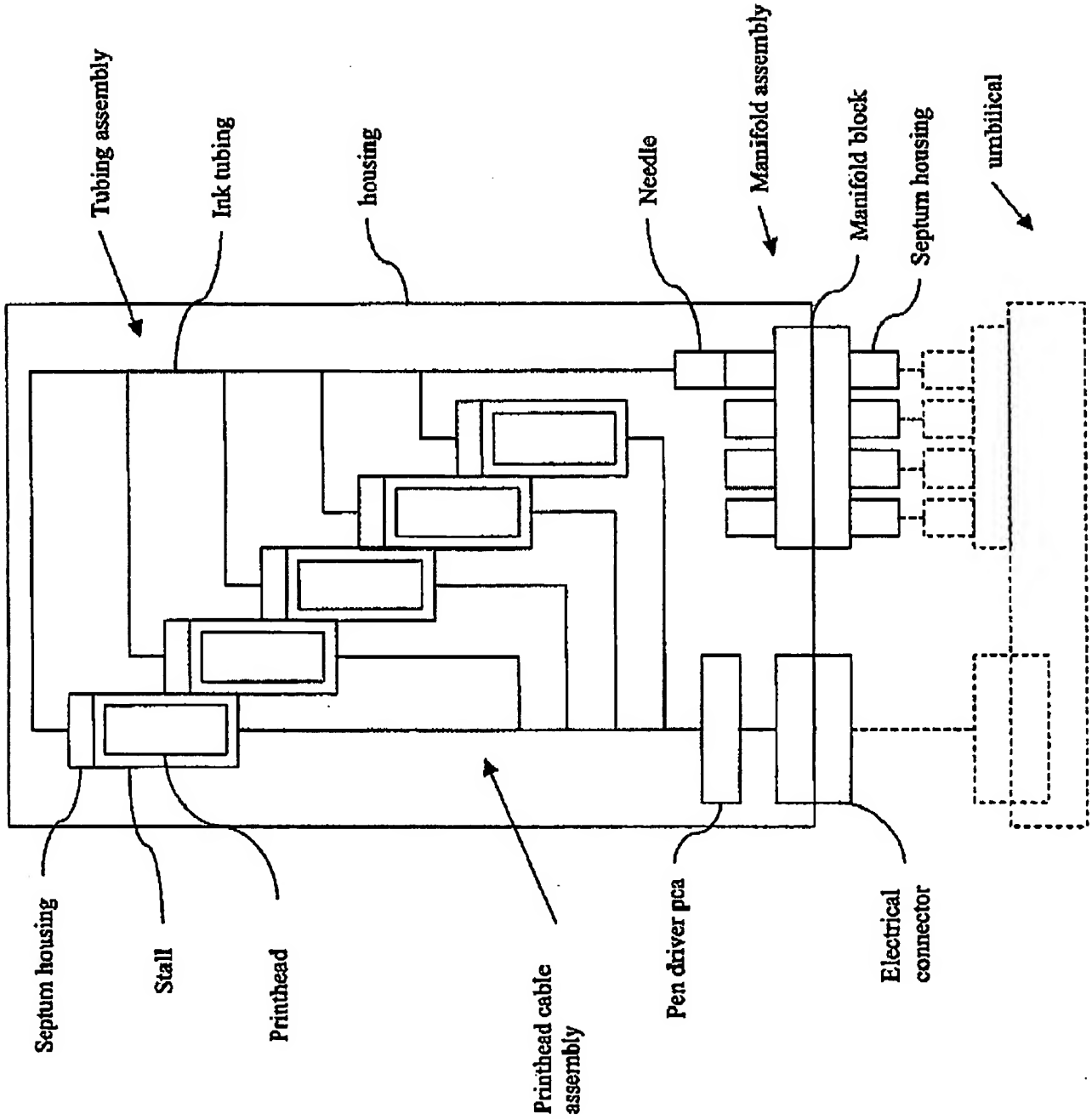
PD Number	200310932
Date Received by Legal	[redacted]


Tubing assembly
Ink tubing
housing
Needle
Manifold assembly
Manifold block
Septum housing
umbilical
Septum housing
Stall
Printhead
Printhead cable assembly
Pen driver pca
Electrical connector

Atty. Dkt. No. 200310932-1

EXHIBIT B

invent

Disclosure No. 200310936

Invention Disclosure - DBi Document No. 6KSY

PD No.	Date Received	Collection
[redacted]	[redacted]	IPG

General Information

Title Ink delivery system

Abstract The present invention is an ink delivery system including a housing, an ink pressurization system, electronical control system, and an external mechanical, electrical, and fluidic interface, a plurality of pairs of ink cartridges, each pair connected to a hot swap valve. The electrical control system controls the ink pressurization system, communicates with ink cartridge acumen, and communicates with a remote printing control system (not shown). The electronical control system also monitors the ink level in each ink cartridge via ILS circuitry and automatically switches a hot swap valve to direct ink from an empty ink cartridge to a full ink cartridge.

Projects TIJ 3.X Imager

Attachments

Attachments 6KSY_fig_1.ppt - [redacted] - FIG 1. System schematic (Uploaded by Mark McGarry)

Description of Invention

Problems Solved Problem: A totally self-contained ink delivery system having hot-swapable ink cartridges does not exist. Consequently, it is difficult for SPS OEM partners to integrate off-axis ink delivery systems into their printers.

Prior Solutions Existing ink delivery systems are not totally self contained and do not allow hot-swapping of ink cartridges. Existing product offering from SPS to OEM partners includes components and reference design only, as opposed to the fully integrated system of the present invention.

Description Refer to figure. The present invention is an ink delivery system including a housing, an ink pressurization system, electronical control system, and an external mechanical, electrical, and fluidic interface, a plurality of pairs of ink cartridges, each pair connected to a hot swap valve.

The electrical control system controls the ink pressurization system, communicates with ink cartridge acumen, and communicates with a remote printing control system (not shown).

The electronical control system also monitors the ink level in each ink cartridge via ILS circuitry and automatically switches a hot swap valve to direct ink from an empty ink cartridge to a full ink cartridge.

Advantages The present invention allows SPS OEM partners to quickly and easily integrate an ink delivery system into their printer.

The hot-swapping functionality prevents the printing system from automatically shutting down due to out of ink conditions and prevents dry-firing of nozzles and

allows an operator to swap out an empty ink cartridge during printer operation.

Invention History

Published	[redacted]
Announced	[redacted]
Disclosed	[redacted]
Next Three Months	[redacted]
Described	[redacted]
Built	[redacted]
Government Contract	[redacted]
Related Disclosure	[redacted]
Innovation Workshop	No

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Witnesses

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Classification

Recommended Classification IPG: Imaging Hardware: Mechanical - Marking Engine Handling and Other

Legal Techword Ink delivery systems - conceptual, components (including valves and pumps), and materials

Keywords ILS, Ink delivery, Ink Delivery System, ink level, ink manifold, Ink Seal, ink supply, Ink Supply Station and ink-delivery system

Recommended Merlin Entity IHWMK

Recommended Merlin Loc .

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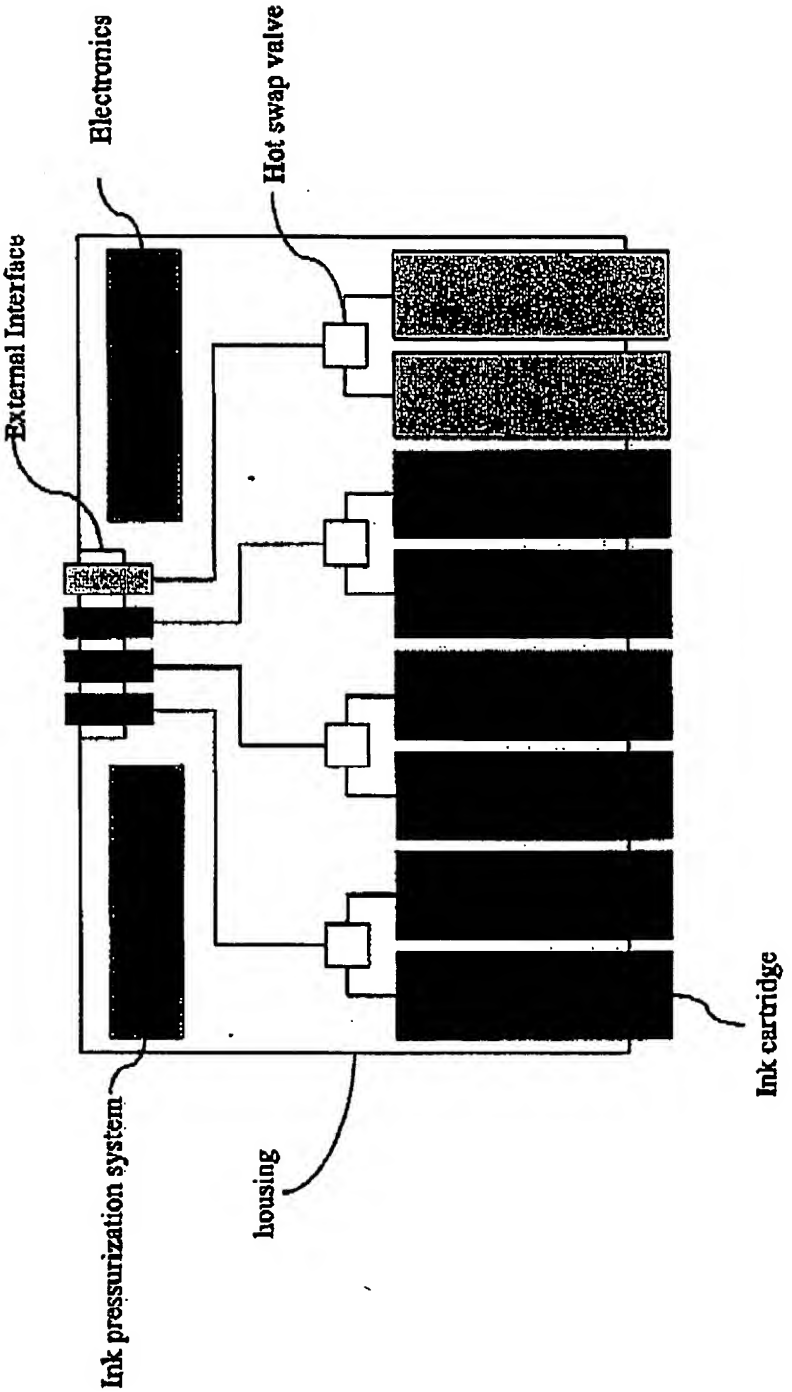
Electronics
Hot swap valve
External Interface
Ink pressurization system
housing
Ink cartridge

Atty. Dkt. No. 200310932-1

EXHIBIT C

Invent

Disclosure No. 200310939

Invention Disclosure - DBi Document No. 6KSZ

PD No.	Date Received	Collection
[redacted]	[redacted]	IPG

General Information

Title ubmilical

Abstract The present invention includes a conduit, a first interface block, a second interface block, and a third interface block. The conduit includes a first end and a second end. The first interface block includes a first mounting plate, a first plurality of ink septum and a first electrical connector. The second interface block includes a second mounting plate and a second plurality of ink septum. The third interface block includes a third mounting plate and a second electrical connector. The first interface block is connected to the first end, the second interface block is connected to the second end, and the third interface block is connected to the second end. The first plurality of ink septum is connected to the second plurality of ink septum via ink tubing. Each tube carries a different type of ink. The first electrical connector is connected to the second electrical connector via electrical cable. The first interace block is intended for interfacing with a mating interface block on a printhead brick assembly. The second interface block is intended for interfacing with a mating interface block on an ink delivery system. The third interface block is intended for interfacing with a mating interface block on a printhead controller.

Projects SPS Imager

Products SPS Imager

Attachments

Attachments umbilical_fig.ppt - [redacted] - Figure describing present invention (Uploaded by Mark McGarry)

Description of Invention

Problems Solved Problem 1: Apparatus for quickly and easily (i.e. SIMPLE!) interfacing electical signals and a plurality of inks between a printhead brick assembly (refer to related invention disclosure 6KSW) and an ink delivery system (refer to related invention disclosure 6KSY) and a printhead controller does not exist. Separate electrical cables and ink tubes are currently required for each printhead. Consequently, it would be exceedingly cumbersome and difficult for SPS OEM partners to provide such an interface.

Problem 2: Apparatus for quickly and easily switching inks on a printer does not exist. The present invention provides apparatus which allows end users to avoid costly downtime associated with flushing/purging old ink and replacing it with a new type of ink (prior method).

Prior Solutions Existing ink tubing between the ink cartridges and printheads is dedicated to a single ink. This makes it very difficult for an operator/technician to switch inks in the printer. This usually requires flushing/purging of the old ink and priming the system with the new type of ink. This process is costly, time consuming

(unacceptable downtime), and messy.

Ink tubing and electrical cabling are currently connected separately to the printhead assembly. This approach is combersome, e.g., too many separate cables.

Description Please refer to the attached figure. The present invention includes a conduit, a first interface block, a second interface block, and a third interface block. The conduit includes a first end and a second end. The first interface block includes a first mounting plate, a first plurality of ink septum and a first electrical connector. The second interface block includes a second mounting plate and a second plurality of ink septum. The third interface block includes a third mounting plate and a second electrical connector. The first interface block is connected to the first end, the second interface block is connected to the second end, and the third interface block is connected to the second end. The first plurality of ink septum is connected to the second plurality of ink septum via ink tubing. Each tube carries a different type of ink. The first electrical connector is connected to the second electrical connector via electrical cable. The first interace block is intended for interfacing with a mating interface block on a printhead brick assembly. The second interface block is intended for interfacing with a mating interface block on an ink delivery system. The third interface block is intended for interfacing with a mating interface block on a printhead controller.

Advantages The present invention provides a simple interface for electical signals and a plurality of inks between a printhead brick assembly and an ink delivery system and a printhead controller. Consequently, system integration time for OEM partners decreases significantly.

The present invetion allows quick, easy, and clean changeover to a new ink with insignificant downtime. No purging/flushing and priming required.

Furthermore, the present invention allows quick and easy troubleshooting of the fluidic and electrical interconnect between a printhead brick and the associated ink delivery system and printhead controller. A technician can simply replace the entire umbilical as a troubleshooting technique to isolate a problem.

Invention History

Published [redacted]
Announced [redacted]
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Next Three Months [redacted]
Described [redacted]
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Government Contract [redacted]
Related Disclosure [redacted]
Innovation Workshop [redacted]

Inventor Information

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Witnesses

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Classification

Recommended Classification	IPG: Imaging Hardware: Mechanical - Marking Engine Handling and Other
Legal Techword	Ink delivery - off-axis, ink tubing, interconnects, etc.
Keywords	ink delivery, Ink Delivery System, ink delivery system, ink manifold, Ink purge, Ink Seal, Ink supply and Ink Supply Station
Recommended Merlin Entity	IHWMK
Recommended Merlin Loc	.

Recommended Merlin Responsible_attorney	Bob Sismilich	Hewlett-Packard Company	0000-1622	San Diego	Worldwide (0000-1622)	bob.sismilich@hp.com

Administrative Record

Date Submitted [redacted]

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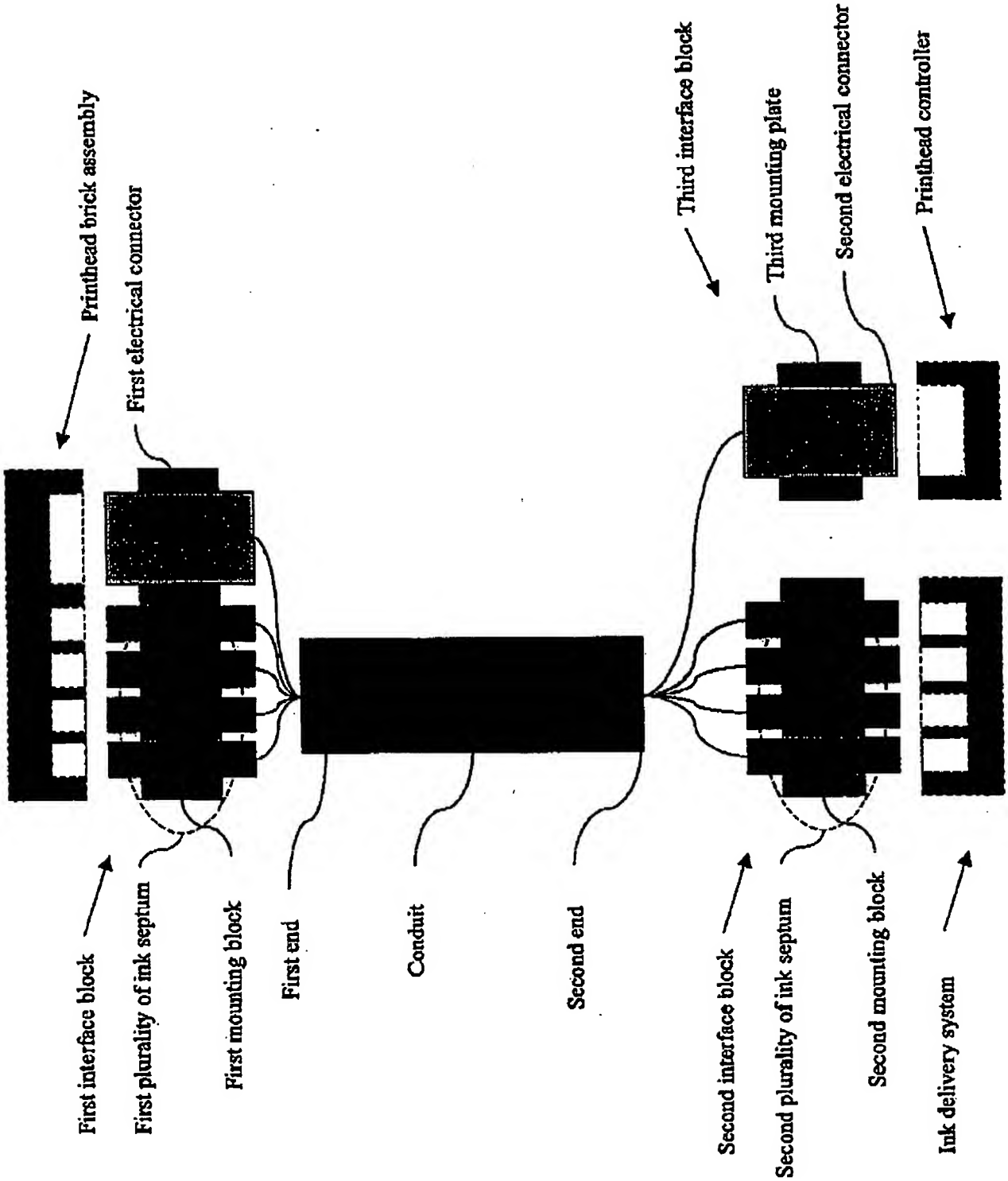
Date Received by Legal [redacted]


Printhead brick assembly
First electrical connector
Third interface block
Third mounting plate
Second electrical connector
Printhead controller
First interface block
First plurality of ink septum
First mounting block
First end
Conduit
Second end
Second interface block
Second plurality of ink septum
Second mounting block
Ink delivery system